

REMARKS

Applicant requests favorable reconsideration and allowance of the subject application in view of the preceding amendments and the following remarks.

At this time, Applicant requests consideration of the Supplemental Information Disclosure Statement filed on December 9, 2002. In this regard, Applicant requests that the Examiner initial and return a copy of the PTO-1449 form, which accompanied that paper, indicating such consideration.

Claims 16-19 and 22-27 are presented for consideration. Claims 16, 18 and 24 are independent. Claims 16, 18 and 24 have been amended to clarify features of the subject invention and claims 25-27 have been added to recite additional features of the invention. Support for these changes and claims can be found in the original application, as filed. Therefore, no new matter has been added.

Applicant requests favorable reconsideration and withdrawal of the rejections set forth in the above-noted Office Action.

Claim 19 was rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. The Examiner asserted that the phrase "said optical element" did not have proper antecedent basis. To expedite prosecution, claim 19 has been amended in light of the Examiner's comments. Applicant submits that these changes overcome this rejection. Such favorable indication is requested.

Turning now to the art rejections, claims 16 and 17 were rejected under 35 U.S.C. § 102 as being anticipated by Japanese patent document no. 7-29816 to Hayata et al. This rejection is respectfully traversed.

In one aspect of the invention, independent claims 16 recites a projection exposure apparatus that includes an illumination optical system for illuminating a reticle with light from a light source, wherein the illumination optical system includes an optical integrator for producing a secondary light source with the light from the light source and masking means for restricting an illumination range upon the reticle, which is to be illuminated, with illumination light from the secondary light source, and a projection optical system for projecting a pattern of the reticle, as illuminated, onto a substrate, measuring means for measuring telecentricity of the projection optical system and changing means for changing an incidence angle of the illumination light, to adjust the telecentricity on the basis of the result of the measurement. The adjusting means moves an optical element disposed in a portion of the illumination optical system between the optical integrator and the masking means, along an optical axis direction.

Applicant submits that the Hayata et al. document does not teach or suggest such features of the present invention, as recited in independent claim 16.

The Hayata et al. document relates to a projection exposure apparatus that includes a zoom lens 8. That document, however, does not teach or suggest any incidence angle changing means for changing an incidence angle of illumination light on the basis of a result of a measurement of measuring means in the manner of the present invention recited in independent claim 16. In this regard, the zoom lens in the Hayata et al. document is not actuated in

accordance with the result of any measurement. Accordingly, Applicant submits that the Hayata et al. document does not teach or suggest the salient features of Applicant's present invention as recited in independent claim 16.

Claims 18-24 were rejected under 35 U.S.C. § 103 as being unpatentable over the Hayata et al. document in view of Japanese patent document no. 6-244083 to Haginiwa et al. Applicant submits that the cited, whether taken individually or in combination, does not teach or suggest such features of the present invention, as recited in independent claims 18 and 24. Accordingly, this rejection also is respectfully traversed.

In another aspect of the invention, independent claim 18 recites various aspects of a projection exposure apparatus that includes, among other features, measuring means for measuring telecentricity of a projection optical system with respect to image heights, including an on-axis position and an off-axis position, first changing means for changing an incidence angle of the illumination light to adjust the telecentricity with respect to the on-axis position, on the basis of the result of the measurement, and second changing means for changing an incidence angle of the illumination light to adjust the telecentricity with respect to the off-axis position, on the basis of the result of the measurement.

In still another aspect of the invention, independent claim 24 recites various aspects of a projection exposure apparatus, which includes, among other features, measuring means for measuring telecentricity of the projection optical system, changing means for changing an incidence angle of the illumination light, to adjust the telecentricity on the basis of the result of

the measurement and adjusting means for adjusting an illuminance distribution on the surface to be illuminated, in accordance with a change made by the changing means.

Applicant submits that the cited art does not teach or suggest such features of the present invention, as recited independent claims 18 and 24.

The Hayata et al. patent shows the use of a telecentricity measuring device. That document, however, does not teach or suggest first and second incidence angle changing means for changing an incidence angle of illumination light on the basis of a result of measurement of a measuring means, in the manner of the present invention recited in independent claim 18.

Similarly, the Haginiwa et al. document does not teach or suggest the use of first and second incidence angle changing means for changing an incidence of illumination light on the basis of measurements made by measuring means, in the manner of the present invention recited in independent claim 18. Accordingly, the Haginiwa et al. document adds nothing to the teachings of the Hayata et al. document that would render obvious Applicant's present invention recited in independent claim 18.

Regarding the present invention recited in independent claim 24, the Hayata et al. document, as discussed above, discusses telecentricity measuring means. Claim 24, however, recites the use of incidence angle changing means for changing the incidence angle of illumination light on the basis of a result of measurement of measuring means and, additionally, adjusting means for compensating for any illuminance non-uniformness to be caused by the change in incidence angle made by the incidence angle changing means. Applicant submits that

the cited art does not teach or suggest at least these features of the invention recited in independent claim 24.

The Hayata et al. document shows the use of correcting means 4 for correcting illuminance non-uniformness. That correcting means, however, does not function to correct illuminance non-uniformness caused by adjustment of incidence angle changing means. Specifically, the Hayata et al. document does not provide any changing means for changing an incidence angle of illumination light on the basis of measurements made by measuring means in the manner of the present invention recited in independent claim 24. Applicant further submits that the Haginiwa et al. document does not teach or suggest such features of the present invention recited in independent claim 24, which have been discussed above. Accordingly, that document adds nothing to the teachings of the Hayata et al. document that would render obvious Applicant's present invention recited in that claim.


For the foregoing reasons, Applicant submits that the present invention, as recited in independent claims 16, 18 and 24, is patentably defined over the cited art.

The dependent claims also should be deemed allowable, in their own right, for defining other patentable features of the present invention in addition to those recited in their respective independent claims. Further individual consideration of these dependent claims is requested.

Applicant further submits that the instant application is in condition for allowance. Favorable reconsideration, withdrawal of the rejections set forth in the above-noted Office Action and an early Notice of Allowance are requested.

Applicant's undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should be directed to our address listed below.

Respectfully submitted,



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